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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/576,171 | 05/22/2000 | Lawrence E. Myers | LWE-110 | 2275 |
| 30869 | 7590 | 11/05/2003 | EXAMINER | |
| LUMEN INTELLECTUAL PROPERTY SERVICES, INC. 2345 YALE STREET, 2ND FLOOR PALO ALTO, CA 94306 | | | MENEFE, JAMES A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2828 | |

DATE MAILED: 11/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/576,171

Applicant(s)

MYERS ET AL.

Examiner

James A. Menefee

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 12.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Paul IP
PAUL IP
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

DETAILED ACTION

Response to Amendment

In response to the amendment filed 9/15/2003, claim 12 is amended. Claims 1-36 are pending.

Drawings

The drawings were received on 9/15/2003. These drawings are acceptable.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 9-10, 22, 25-27 and 34-35 rejected under 35 U.S.C. 103(a) as being unpatentable over Knox (previously cited 5,627,854). The claimed invention is taught as follows:

Regarding claims 1-4, Knox discloses a saturable reflector apparatus comprising a substrate 14 comprising a first surface and a second surface, a reflector 12,13 deposited on the second surface of the substrate 14, the reflector including a saturable absorber layer 11. It is not disclosed that the first surface of the substrate is a modified surface, such that an etalon is formed between the reflector and said first surface of the substrate. However, it is well known, that a surface of a substrate is often a modified surface. For example, the substrate is often cleaved, polished, coated with a metal or a dielectric, or modified in any number of other ways during the

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basic fabrication of a device. Such a modification as mentioned above would affect this modified surface in such a manner so that an etalon would be formed between the reflector and the modified surface. It would have been obvious to one skilled in the art to modify the surface of the substrate in such a manner, because such modifications are often done to protect the substrate from impurities, achieve appropriate flatness of the substrate, or achieve a particular size of substrate, as is well known.

Regarding claim 9, Knox discloses the reflector includes a Bragg stack, making the reflector a saturable Bragg reflector.

Regarding claim 10, Knox discloses the reflector includes a metal or dielectric film.

Regarding claim 22, Knox discloses in Fig. 4 a laser comprising an optical cavity, a lasing medium 46 disposed in said optical cavity, a pump 48 that provides radiation to the lasing medium, and a saturable reflector 49 optically coupled to the cavity. It was shown in the above rejection of claim 1 that the saturable reflector may obviously be as claimed.

Regarding claims 25-27 and 34-35, the limitations are taught as in the rejections of claims 2-4 and 9-10 respectively above.

Claims 5-8, 11-21, 28-33, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knox in view of Weingarten et al. (previously cited US 6,393,035). Knox teaches the limitations of the claims shown above, but does not disclose the following:

Regarding claims 5-8, 16-18, and 28-31, Knox does not disclose that there are means for tuning the etalon effect, particularly a heater or cooler element with a temperature controller for adjusting the optical thickness of the substrate. Weingarten teaches a saturable reflector having

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portions that are temperature tuned (col. 5 lines 29-62). It is inherent that temperature tuning may be done by a heating or cooling element having a temperature controller. It would have been obvious to one skilled in the art to temperature tune the material of the saturable reflector because this allows for an optimization of the modulation depth of the device, leading to the advantages given in lines 57-62, as taught by Weingarten.

Regarding claims 11, 32-33, and 36, Knox does not disclose the thickness of the substrate. Weingarten teaches a similar saturable Bragg reflector where the substrate is 400 microns, thus falling within the claimed range (col. 12 line 61). It would have been an obvious engineering design consideration to make the substrate this thick, because the thickness of the substrate does not appear to be critical to the operation of either Knox or Weingarten, and thus using the thickness shown in Weingarten will not significantly change the operation of Knox's device. Therefore the substrate has a thickness large enough to act like an etalon having a free spectral range of the same order as a linewidth of the laser, i.e. 1 GHz.

Regarding claim 12, this is a method claim that is a method of tuning a saturable reflector. The reflector is taught as in the rejection of claim 1 above. Knox does not disclose that the spectrum of radiation entering the etalon of the reflector may be modified. However, as shown in the rejection of claims 5-8 and 16-18, Weingarten teaches that the etalon effect may be tuned, thus modifying the spectrum of radiation through the etalon. Motivation is the same as that shown in the rejection of claims 5-8 and 16-18 above.

Regarding claims 13-15, Knox teaches these limitations as in the rejection of claims 2-4 above.

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Regarding claims 19 and 21, it is not disclosed that the tuning will adjust the values as claimed. Examiner contends that should the device be tuned, as shown to be obvious in the above claim rejections, then the values as claimed will necessarily be adjusted.

Regarding claim 20, it is not disclosed that the tuning optimizes a relationship between temporal and frequency domains. It would have been obvious to one skilled in the art to tune the device such that this relationship is optimized, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knox in view of Kortz et al. (previously cited US 5,848,079). Knox teaches the limitations of claim 22 but does not disclose the laser cavity having a nonlinear crystal, specifically the type of crystal as claimed. Kortz teaches a laser cavity that includes a nonlinear crystal made of lithium borate (col. 4 lines 1-24). It would have been obvious to one skilled in the art to include such a nonlinear crystal in the laser cavity because it provides frequency multiplication, as taught by Kortz, thus a lower wavelength as required by a specific application may be attained.

Response to Arguments

Applicant's arguments filed 9/15/2003 have been fully considered but they are not persuasive. Applicant made the following arguments:

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- Arguments that the inadvertent etalon suggested by the Examiner teaches away from the claimed invention (pp. 11-12 of response).

Applicant makes arguments that the etalon formed by modifying the surface of the substrate in Knox will not form an etalon, or will be detrimental to the performance of Knox. This is not persuasive. Even if the etalon is not a strong etalon, even if the etalon is detrimental to the performance of the device, and even if the etalon is inadvertent, there will still be an etalon formed as claimed, and thus this limitation is met.

Applicant contends that any detrimental performance caused by such an etalon would cause one skilled in the art to refrain from modifying the substrate surface. However, persons skilled in the art must weigh the advantages and disadvantages of doing certain things all of the time when building devices. Just because there may be a detrimental performance, absent any evidence that the device will be totally inoperable, is not persuasive evidence that one skilled in the art would necessarily refrain from modifying the surface.

- Argument that one skilled in the art would roughen the back surface of the substrate, thus removing any etalon (p. 12 of response).

While the newly cited Howle reference teaches that it may be advantageous to one skilled in the art to roughen a back surface of the substrate, it is not inherent that one skilled in the art is necessarily compelled do this, and thus one skilled in the art will not necessarily remove the etalon from the system.

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- Argument Knox teaches away from the claimed invention in col. 3 lines 13-16 (p. 12 of response).

While it is true that Knox states that his reflector is not an etalon reflector, this is because the opposite side of Knox's substrate is not modified. If this side were modified, as deemed obvious in the above rejection, then Knox's reflector would be an etalon reflector.

- Argument that under MPEP 2143.01, the proposed modification would render Knox unsatisfactory for its intended purpose, and thus there is no *prima facie* case of obviousness (pp. 12-13 of response).

This section of the MPEP is supported by *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). In *Gordon*, the rejection was reversed because the modification would cause the prior art to be inoperable. This is distinguishable from the present case. Here, the modification would perhaps cause a detrimental effect, but would not render the device inoperable. It is not believed that the detrimental effect would cause the device of Knox to be inoperable.

- Argument that there is no reasonable expectation of success to combine, as required in MPEP 2143.02 (p. 13 of response).

The applicant does not provide any evidence that there is no reasonable expectation of success. The applicant admits that modifications are often done to the back surface of the

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substrate (p. 11 of response), and the modifications would not cause the device to be inoperable, thus there appears to be a reasonable expectation of success.

- Arguments that there is no *prima facie* case of obviousness because the inadvertent etalon will not achieve the features of the applicant's invention (p. 13 of response).

The Examiner makes no claim that the modification of Knox would provide an etalon having these characteristics. However, it is noted that the features upon which applicant relies are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

- Argument that the combination of Knox and Weingarten is materially different than the claimed invention (p. 14 of response).

While the tuning done by Weingarten does not specifically teach that it will tune an etalon effect, it is believed that this tuning will indeed change the etalon effect during the course of the obvious heating/cooling of the elements of the laser device.

- The remaining arguments (pp. 14-15, discussing the other dependent claims) are based on the arguments against the modification of Knox, and are already discussed above.

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Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (703) 605-4367. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



JM
October 28, 2003



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